Physics 1 (H) QUIZ 2

Newton's Laws Name:

Directions: Show all work and circle all of your final answers. Good Luck!

Section I: Multiple Choice (1.5 points each.) Circle the most correct response:

1. Which of the following is true of inertia? Circle **all** that apply.

[a] It is described in Newton's first law of motion.
[b] It describes an object's tendency to maintain its original state of motion
[c] Mass is directly correlated with inertia
[d] It is a property of motion

2. A force of 180. Newtons acts on an object that has a mass of 2.0×10^3. **grams**. What is the acceleration in m/s^2 of the object?

[a] 90. m/s^2
[b] 0.900 m/s^2
[c] 36 m/s^2
[d] 3.6×10^4 m/s^2

3. In interactions of action-reaction pairs involving Earth and everyday objects, the effect on Earths motion is often negligible because;

[a] Field forces do not obey Newton's Third Law
[b] Earth has such a large mass compared with everyday objects
[c] Everyday objects cannot exert forces on the earth
[d] action-reaction pairs do not apply to gravity

4. A force of 50.0 N is applied to an object and the object accelerates at a rate of 5.00 m/s^2. What is the weight of the object?

[a] 98.1 N
[b] 10 kg
[c] 9.81N
[d] 10 N

Section II: Short Answer (2 points each)

5. Describe **Newton's First Law** and provide an example to demonstrate this law:

6. Describe **Newton's Second Law** and provide an example to demonstrate this law:

7. Describe **Newton's Third Law** and provide an example to demonstrate this law:

8. You are in space and all that you have with you is your tool bag. There are no forces currently acting on you and you are hovering about 100 meters from the spaceship and need to make it back safely. What do you do? Which of Newton's Laws guarantees that this will work?

9. Describe the difference between **mass** and **weight**

Section II: Short Answer Answer the following questions and circle the final answers. Be sure to show ALL work and draw the appropriate diagrams.

Problem 1.(5 points.) A force of 50.0 N that is directed at an angle of 30^o with the horizontal is applied to a crate. If the force of friction acting on the crate is 12.0 N and the crate weighs 98.1 N, find the mass of the crate as well as the acceleration of the crate. If the crate is initially at rest, how far will it travel in 10 seconds?

Problem 2.(3 points.) A car's engine exerts a force of 40 N to the right. If the car is traveling at a constant velocity of 45 mph, find the force of friction acting on the vehicle.

Problem 3. (5 points.) A 5 kg bucket of water is raised from a well by a rope. If the upward acceleration of the bucket is 3 m/s^2, find the force exerted by the rope on the bucket of water.